



PGS

HERITAGE

***HERITAGE IMPACT ASSESSMENT FOR THE PROPOSED SEWER
PIPELINE IN PRECINCT 4 OF THE UMHLANGA RIDGESIDE
DEVELOPMENT, DURBAN, ETHEKWINI MUNICIPALITY, KWAZULU
NATAL***

Phase 1 – Heritage Impact Assessment

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Declaration of Independence

The report has been compiled by PGS Heritage (Pty) Ltd, an appointed Heritage Specialist for Nemaï Consulting for the proposed Sewer Pipeline in Precinct 4 of the Umhlanga Ridgeside Development. The views stipulated in this report are purely objective and no other interests are displayed during the decision-making processes discussed in the Heritage Impact Assessment Process.

I, Wouter Fourie, declare that –

General declaration:

- I act as the independent archaeological specialist in this application
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting archaeological impact assessments, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I will take into account, to the extent possible, the matters listed in section 38 of the NHRA when preparing the application and any report relating to the application;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- I will ensure that information containing all relevant facts in respect of the application is distributed or made available to interested and affected parties and the public and that participation by interested and affected parties is facilitated in such a manner that all interested and affected parties will be provided with a reasonable opportunity to participate and to provide comments on documents that are produced to support the application;
- I will provide the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not
- All the particulars furnished by me in this form are true and correct;
- I will perform all other obligations as expected of an archaeological specialist in terms of the Act and the constitutions of my affiliated professional bodies; and

- I realise that a false declaration is an offence in terms of regulation 71 of the Regulations and is punishable in terms of section 24F of the NEMA.

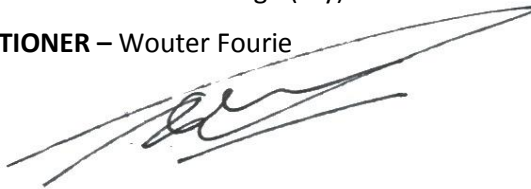
Disclosure of Vested Interest

- I do not have and will not have any vested interest (either business, financial, personal or other) in the proposed activity proceeding other than remuneration for work performed in terms of the Regulations;

HERITAGE CONSULTANT -

PGS Heritage (Pty) Ltd

PRINCIPAL HERITAGE PRACTITIONER – Wouter Fourie



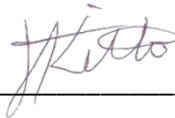
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ACKNOWLEDGEMENT OF RECEIPT

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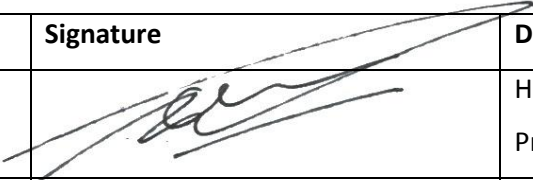
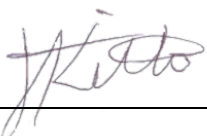
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Date -	25 October 2018		
Document Title	<i>Heritage Impact Assessment for the Proposed Sewer Pipeline in Precinct 4 of the Umhlanga Ridgeside Development, Durban, eThekweni Municipality, KwaZulu Natal.</i>		
Control	Name	Signature	Designation
Project Sponsor	Wouter Fourie		Heritage Specialists/ Principal Investigator
Author	Jennifer Kitto		Heritage Specialist
Reviewed	Kristy Robertson		Environmental Consultant

EXECUTIVE SUMMARY

PGS Heritage (Pty) Ltd was appointed by Nema Consulting to undertake a Heritage Impact Assessment that forms part of the Basic Assessment Report for the proposed development of a Sewer Pipeline in Precinct 4 of the Umhlanga Ridgeside Development, Durban, eThekweni Municipality, KwaZulu Natal.

No heritage sites were identified within the proposed development area for either of the three sewer route alternatives.

No mitigation measures and permits are therefore required and there were no “no go” areas identified.

However, should any chance finds of heritage sites and/or objects be located or observed, a heritage specialist must immediately be contacted and the General Management guidelines will apply (Refer to Section 8 for guidelines).

This report has been compiled taking into account the National Environmental Management Act (NEMA) Appendix 6 requirements for specialist reports as indicated in the table below.

NEMA Regs (2017) - Appendix 6	Relevant section in report
Details of the specialist who prepared the report	Page 2 of Report – Contact details and company
The expertise of that person to compile a specialist report including a curriculum vitae	Section 1.2 – refer to Appendix B
A declaration that the person is independent in a form as may be specified by the competent authority	Page 2 of the report
An indication of the scope of, and the purpose for which, the report was prepared	Section 1.1
The date and season of the site investigation and the relevance of the season to the outcome of the assessment	Section 5
A description of the methodology adopted in preparing the report or carrying out the specialised process	Section 3
The specific identified sensitivity of the site related to the activity and its associated structures and infrastructure	N/A, Section 6
An identification of any areas to be avoided, including buffers	N/A, Section 6
A map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	N/A
A description of any assumptions made and any uncertainties or gaps in knowledge;	Section 1.3
A description of the findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives, on the environment	Section 5
Any mitigation measures for inclusion in the EMPr	Section 6
Any conditions for inclusion in the environmental authorisation	Section 6
Any monitoring requirements for inclusion in the EMPr or environmental authorisation	Section 8 and 9
A reasoned opinion as to whether the proposed activity or portions thereof should be authorised and	Section 6
If the opinion is that the proposed activity or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan	
A description of any consultation process that was undertaken during the course of carrying out the study	Not applicable. A public consultation process will be part of the EIA and EMP process.
A summary and copies if any comments that were received during any consultation process	Not applicable. To date not comments regarding heritage resources that require input from a specialist have been raised.
Any other information requested by the competent authority.	Not applicable.

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1 INTRODUCTION

PGS Heritage (Pty) Ltd (PGS) was appointed by Nemai Consulting (Nemai) to undertake a Heritage Impact Assessment (HIA) that forms part of the Basic Assessment (BA) Report for the proposed development of a Sewer Pipeline in Precinct 4 of the Umhlanga Ridgeside Development, Durban, eThekweni Municipality KwaZulu Natal.

No heritage sites¹ were identified within the proposed development area.

1.1 Scope of the Study

The aim of the study is to identify possible heritage sites and finds that may occur in the proposed development area which will assist to determine if the proposed layout is viable. The HIA aims to inform the BA in the development of a comprehensive Environmental Management Programme (EMPr) to assist the developer in managing the discovered heritage resources in a responsible manner, in order to protect, preserve, and develop the heritage resources within the framework provided by the National Heritage Resources Act of 1999 (Act 25 of 1999) (NHRA).

1.2 Specialist Qualifications

This HIA was compiled by PGS.

The staff at PGS have a combined experience of nearly 80 years in the heritage consulting industry. PGS and its staff have extensive experience in managing HIA processes and will only undertake heritage assessment work where they have the relevant expertise and experience to undertake that work competently.

Jennifer Kitto, co-author, has 17 years' experience in the heritage sector, a large part of which involved working for a government department responsible for administering the National Heritage Resources

¹ **Heritage site** as used in this report refers to a place/locality where a heritage resource occurs and not a declared heritage site as contemplated by s2 of the NHRA. "s2(xviii) *heritage site*" means a place declared to be a national heritage site by SAHRA or a place declared to be a provincial heritage site by a provincial heritage resources authority;

Act, No 25 of 1999. She is therefore well-versed in the legislative requirements of heritage management. She holds a BA in Archaeology and Social Anthropology and a BA (Hons) in Social Anthropology.

Mr Wouter Fourie, the Project Coordinator, is registered with the Association of Southern African Professional Archaeologists (ASAPA) as a Professional Archaeologist and is accredited as a Principal Investigator; he is further an Accredited Professional Heritage Practitioner with the Association of Professional Heritage Practitioners (APHP).

Refer to **Appendix B** for CV's.

1.3 Assumptions and Limitations

Not detracting in any way from the comprehensiveness of the fieldwork undertaken, it is necessary to realise that the heritage resources located during the fieldwork do not necessarily represent all the possible heritage resources present within the development area. Various factors account for this, including the subterranean nature of some archaeological sites. As such, should any heritage features and/or objects not included in the present inventory, be located or observed, a heritage specialist must immediately be contacted.

Such observed or located heritage features and/or objects may not be disturbed or removed in any way until such time that the heritage specialist has been able to make an assessment as to the significance of the site (or material) in question, which also applies to graves and burial grounds. In the event that any graves or burial grounds are located during the development, the procedures and requirements pertaining to graves and burials will apply as set out below.

1.4 Legislative Context

The identification, evaluation and assessment of any cultural heritage site, artefact or find in the South African context is required and governed by the following legislation -

- i. National Environmental Management Act (NEMA) Act 107 of 1998
- ii. National Heritage Resources Act (NHRA) Act 25 of 1999

- iii. Minerals and Petroleum Resources Development Act (MPRDA) Act 28 of 2002

The following sections in each Act refer directly to the identification, evaluation and assessment of cultural heritage resources.

- i. GNR 982 (Government Gazette 38282, 14 December 2014) promulgated under the National Environmental Management Act (NEMA) Act 107 of 1998
 - a. Basic Assessment Report (BAR) – Regulations 19 and 23
 - b. Environmental Scoping Report (ESR) – Regulation 21
 - c. Environmental Impacts Assessment (EIA) – Regulation 23
 - d. Environmental Management Programme (EMPr) – Regulations 19 and 23
- ii. National Heritage Resources Act (NHRA) Act 25 of 1999
 - a. Protection of Heritage Resources – Sections 34 to 36; and
 - b. Heritage Resources Management – Section 38
- iii. Minerals and Petroleum Resources Development Act (MPRDA) Act 28 of 2002
 - a. Section 39(3)

The NHRA stipulates that cultural heritage resources may not be disturbed without authorization from the relevant heritage authority, and that an HIA will be required if a development triggers any of the development types listed in section 38 of the NHRA. Sections 34-36 further stipulates the protections afforded to structures older than 60 years, archaeological, palaeontological, meteorites, graves and burial grounds, as well as the process to be followed if these resources need to be disturbed.

In addition, the NEMA (No 107 of 1998) and the GNR 982 (Government Gazette 38282, 14 December 2014) state that, “the objective of an environmental impact assessment process is to, ... identify the location of the development footprint within the preferred site ... focussing on the geographical, physical, biological, social, economic, cultural and heritage aspects of the environment” (GNR 982, Appendix 3(2)(c), emphasis added). In accordance with legislative requirements and EIA rating criteria, the regulations of SAHRA and ASAPA have also been incorporated to ensure that a comprehensive legally compatible HIA report is compiled.

1.5 Terminology and Abbreviations

Archaeological resources

This includes -

- i. material remains resulting from human activity which are in a state of disuse and are in or on land and which are older than 100 years including artefacts, human and hominid remains and artificial features and structures;
- ii. rock art, being any form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and which is older than 100 years, including any area within 10m of such representation;
- iii. wrecks, being any vessel or aircraft, or any part thereof which was wrecked in South Africa, whether on land, in the internal waters, the territorial waters or in the maritime culture zone of the republic as defined in the Maritimes Zones Act, and any cargo, debris or artefacts found or associated therewith, which is older than 60 years or which SAHRA considers to be worthy of conservation;
- iv. features, structures and artefacts associated with military history which are older than 75 years and the site on which they are found.

Cultural significance

This means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance

Development

This means any physical intervention, excavation, or action, other than those caused by natural forces, which may in the opinion of the heritage authority in any way result in a change to the nature, appearance or physical nature of a place or influence its stability and future well-being, including -

- i. construction, alteration, demolition, removal or change in use of a place or a structure at a place;
- ii. carrying out any works on or over or under a place;
- iii. subdivision or consolidation of land comprising a place, including the structures or airspace of a place;

- iv. constructing or putting up for display signs or boards;
- v. any change to the natural or existing condition or topography of land; and
- vi. any removal or destruction of trees, or removal of vegetation or topsoil

Earlier Stone Age

The archaeology of the Stone Age, between 400 000 and 2500 000 years ago.

Fossil

Mineralised bones of animals, shellfish, plants and marine animals. A trace fossil is the track or footprint of a fossil animal that is preserved in stone or consolidated sediment.

Heritage

That which is inherited and forms part of the National Estate (Historical places, objects, fossils as defined by the National Heritage Resources Act 25 of 1999).

Heritage resources

This means any place or object of cultural significance.

Holocene

The most recent geological time period which commenced 10 000 years ago.

Later Stone Age

The archaeology of the last 30 000 years, associated with fully modern people.

Late Iron Age (Early Farming Communities)

The archaeology of the last 1000 years up to the 1800s, associated with people who carried out iron working and farming activities such as herding and agriculture.

Middle Stone Age

The archaeology of the Stone Age between 30 000-300 000 years ago, associated with early modern humans.

Palaeontology

Any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trace.

Abbreviations	Description
AIA	Archaeological Impact Assessment
ASAPA	Association of Southern African Professional Archaeologists
BA	Basic Assessment
CRM	Cultural Resource Management
DEA	Department of Environmental Affairs
EIA practitioner	Environmental Impact Assessment Practitioner
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
ESA	Earlier Stone Age
GPS	Global Positioning System
HIA	Heritage Impact Assessment
I&AP	Interested & Affected Party
LSA	Later Stone Age
LIA	Late Iron Age
MSA	Middle Stone Age
MIA	Middle Iron Age
NEMA	National Environmental Management Act
Nemai	Nemai Consulting
NHRA	National Heritage Resources Act
PGS	PGS Heritage (Pty) Ltd
PHRA	Provincial Heritage Resources Authority
ROD	Record of Decision
SADC	Southern African Development Community
SAHRA	South African Heritage Resources Agency

Refer to **Appendix A** for further discussions on heritage management and legislative frameworks.

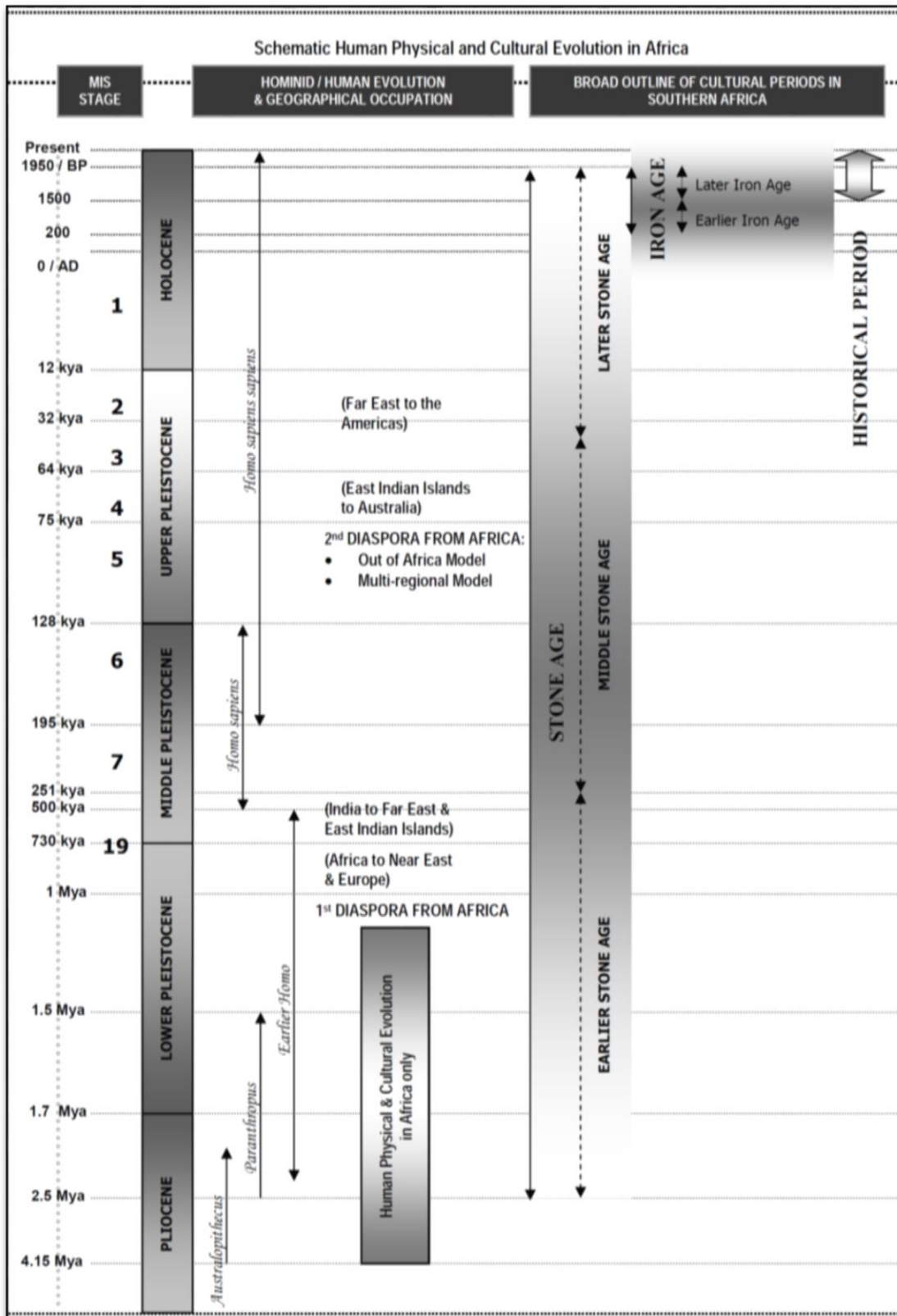


Figure 1 - Human and Cultural Time line in Africa (Morris, 2008).

2 TECHNICAL DETAILS OF THE PROJECT

2.1 Project Description

The proposed Sewer Pipeline will be located in Precinct 4 of the Umhlanga Ridgeside Development, Durban, eThekweni Municipality, KwaZulu Natal.

The Umhlanga Ridgeside development received environmental authorization in 2007 for mixed land use development. The development will consist of residential, commercial, resort and open space development. This development will also include the construction of internal services such as sewage, water and electricity, the construction of stormwater management services, the construction of new roads and intersection, as well as the upgrading of existing roads and intersection.

Tongaat Hullet has appointed Nema Consulting to undertake the BA for the proposed sewer development for the Umhlanga Ridgeside Development. The sewer alternatives did not form part of the original environmental authorisation.

The proposed development includes the following alternative route alignments for the sewer pipeline as follows:

- Alternative 1 - the construction of a new 250mm diameter PVC sewer pipeline approximately 825m in length (in green **Figure 2**)
- Alternative 2 - the replacement of approximately 770m of an existing sewer pipeline with a new 250mm diameter pipeline (in red **Figure 2**)
- Alternative 3 - the replacement of approximately 770m of an existing sewer pipeline with a new 250mm diameter pipeline (in blue **Figure 2**)

In addition, three alternatives have been considered in the BA for the stormwater component of the project. However, all three options fall below the required threshold that require a HIA (refer to Section 8.1, 1A of this report). Therefore the stormwater components to the project have not been assessed in the HIA.



Figure 2 - Google Earth image of the proposed sewer pipeline alternative routes to the Umhlanga Ridgeside development (Map provided by Nemai Consulting, 2018).

2.2 Site Description

The main areas surrounding the proposed developments include Umhlanga Rocks, La Lucia, Mount Edgecombe and Somerset Park. The area is highly urbanised. The proposed sewer pipeline follows Armstrong Avenue in a North - North-eastern direction, cutting east toward the M41 - Ruth First Highway.

The proposed new alternative 1 pipeline route (green) crosses the M41 in a Northern direction towards Umhlanga. The last part of the proposed pipeline ends in cleared area set aside for development, which is evident by the white beacons placed over the entirety of the area.

The entire area is characterised by dense urban development with some open areas and vacant land. Most of the development consists of office parks.



Figure 3 – View of Armstrong Avenue, looking north along Alt 1 and 3



Figure 4 – View of dense vegetation on the western side of Armstrong Avenue (Alt 1 alignment)



Figure 5 – View looking north along the route of all three alternatives



Figure 6 – View of the cleared area marked out for development at the northern end of the route of all three alternatives

3 ASSESSMENT METHODOLOGY

The section below outlines the assessment methodologies utilised in the study.

3.1 Methodology for Assessing Heritage Site Significance

The applicable maps, tables and figures are included, as stipulated in NHRA and NEMA. The HIA process consists of three steps:

Step I – Literature Review - The background information to the field survey relies greatly on the Heritage Background Research.

Step II – Physical Survey - A physical survey was conducted predominantly by vehicle and on foot along the proposed area by a qualified archaeologist, which aimed at locating and documenting sites falling within and adjacent to the proposed development footprint.

Step III – The final step involved the recording and documentation of relevant archaeological resources, the assessment of resources in terms of the HIA criteria and report writing, as well as mapping and constructive recommendations.

The significance of the identified heritage sites is based on four main criteria -

- Site integrity (i.e. primary vs. secondary context),
- Amount of deposit, range of features (e.g., stonewalling, stone tools and enclosures),
- Density of scatter (dispersed scatter)
 - Low - <10/50m²
 - Medium - 10-50/50m²
 - High - >50/50m²
- Uniqueness; and
- Potential to answer present research questions.

Management actions and recommended mitigation, which will result in a reduction in the impact on the sites, will be expressed as follows -

A - No further action necessary;

B - Mapping of the site and controlled sampling required;

C - No-go or relocate development activity position;

D - Preserve site, or extensive data collection and mapping of the site; and

E - Preserve site.

Impacts on these sites by the development will be evaluated as follows –

3.1.1 Site Significance

Site significance classification standards prescribed by the SAHRA (2006) and approved by the ASAPA for the Southern African Development Community (SADC) region, were used for the purpose of this report.

Table 1: Site significance classification standards as prescribed by SAHRA.

FIELD RATING	GRADE	SIGNIFICANCE	RECOMMENDED MITIGATION
National Significance (NS)	Grade 1		Conservation; National Site nomination
Provincial Significance (PS)	Grade 2		Conservation; Provincial Site nomination
Local Significance (LS)	Grade 3A	High Significance	Conservation; Mitigation not advised
Local Significance (LS)	Grade 3B	High Significance	Mitigation (Part of site should be retained)
Generally Protected A (GP.A)		High / Medium Significance	Mitigation before destruction
Generally Protected B (GP.B)		Medium Significance	Recording before destruction
Generally Protected C (GP.A)		Low Significance	Destruction

3.2 Methodology for Impact Assessment

To ensure uniformity, a standard impact assessment methodology has been utilised so that a wide range of impacts can be compared. The impact assessment methodology makes provision for the assessment of impacts against the following criteria:

- Significance;
- Spatial scale;
- Temporal scale;
- Probability; and
- Degree of certainty.

A combined quantitative and qualitative methodology was used to describe impacts for each of the assessment criteria mentioned above. A summarised explanation of each of the qualitative descriptors, along with the equivalent quantitative rating scale for each of these criteria, is given in *Table 2*.

Table 2: Impact Assessment Criteria

CRITERIA	CATEGORIES	EXPLANATION
Overall nature	Negative	Negative impact on affected biophysical or human environment.
	Positive	Benefit to the affected biophysical or human environment.
Type	Direct	Are caused by the action and occur at the same time and place.
	Indirect or Secondary	Are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. May include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.
Spatial Extent over which impact may be experienced	Cumulative	Is the impact on the environment, which results from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.
	Site	Immediate area of activity incorporating a 50m zone which extends from the edge of the affected area.
Duration of impact	Local	Area up to and/or within 10km of the 'Site' as defined above.
	Regional	Entire community, drainage basin, landscape etc.
	National	South Africa.
	Short-term	Impact would last for the duration of activities such as land clearing, land preparation, fertilising, weeding, pruning and thinning. Quickly reversible.
Severity	Medium-term	Impact would after the project activity such as harvesting. Reversible over time.
	Long-term	Impact would continue beyond harvesting/ extraction of the trees.
	Permanent	Impact would continue beyond decommissioning.
	Low, Medium, High Negative	Based on separately described categories examining whether the impact is destructive or benign, whether it destroys the impacted environment, alters its functioning or slightly alters the environment itself.
Low, Medium, High Positive		
Reversibility	Completely Reversible	The impact can be completely reversed with the implementation of correct mitigation and rehabilitation measures.
	Partly Reversible	The impact can be partly reversed providing mitigation measures are implemented and rehabilitation measures are undertaken

Irreplaceable Loss	Irreversible	The impact cannot be reversed, regardless of the mitigation or rehabilitation measures.
	Resource will not be lost	The resource will not be lost or destroyed provided mitigation and rehabilitation measures are implemented.
	Resource may be partly destroyed	Partial loss or destruction of the resource will occur even though all management and mitigation measures are implemented.
	Resource cannot be replaced	The resource cannot be replaced no matter which management or mitigation measures are implemented.
Probability of occurrence	Unlikely	<40% probability.
	Possible	40% probability.
	Probable	>70% probability.
	Definite	>90% probability.
Mitigation Potential [i.e. the ability to manage or mitigate an impact given the necessary resources and feasibility of application.]	High or Completely Mitigatable	<p>Relatively easy and cheap to manage. Specialist expertise or equipment is generally not required.</p> <p>The nature of the impact is understood and may be mitigated through the implementation of a management plan or through ‘good housekeeping’. Regular monitoring needs to be undertaken to ensure that any negative consequences remain within acceptable limits.</p> <p>The significance of the impact after mitigation is likely to be low or negligible.</p>
	Moderate or Partially Mitigatable	<p>Management of this impact requires a higher level of expertise and resources to maintain impacts within acceptable levels. Such mitigation can be tied up in the design of the Project.</p> <p>The significance of the impacts after mitigation is likely to be low to moderate.</p> <p>May not be possible to mitigate the impact entirely, with a residual impact(s) resulting.</p>
	Low or Unmitigatable	<p>Will not be possible to mitigate this impact entirely regardless of the expertise and resources applied.</p> <p>The potential to manage the impact may be beyond the scope of the Project.</p> <p>Management of this impact is not likely to result in a measurable change in the level of significance.</p>
Impact Significance	Negligible	-
	Low	Largely of HIGH mitigation potential, <u>after</u> considering the other criteria.
	Moderate	Largely of MODERATE or partial mitigation potential <u>after</u> considering the other criteria.
	Substantial	Largely of LOW mitigation potential <u>after</u> considering the other criteria.

4 ARCHIVAL AND DESKTOP RESEARCH FINDINGS

4.1 Archival findings

The aim of the archival background research is to identify possible heritage resources that could be encountered during fieldwork, as summarised in **Table 3**.

Table 3: Summary of History of the study area

DATE	DESCRIPTION
<p>2.5 million to 250 000 years ago</p>	<p>The Earlier Stone Age (ESA) is the first and oldest phase identified in South Africa’s archaeological history and comprises two technological phases. The earliest of these is known as Oldowan and is associated with more robust flaked tools. It dates to approximately <2 million years ago. The second technological phase is the Acheulian and comprises more refined stone artefacts such as the cleaver and bifacial hand axe. The Acheulian dates back approximately 1.5 million years ago.</p> <p>The HIA conducted at Corobrick by Prins (2014) identified a number of out of context stone artefacts, including an Earlier Stone Age cleaver. This locality is roughly 5 km south-west of the present study area.</p>
<p>>250 000 to 40 000 years ago</p>	<p>The Middle Stone Age (MSA) is associated with flakes, points and blades manufactured by means of the prepared core technique. This phase is furthermore associated with modern humans and complex cognition (Wadley 2013).</p> <p>Several well-known MSA sites are located in the general region of the study area. Sibudu Cave for example, is located roughly 17 km north of the present study area and has a deep, well-dated Middle Stone Age (MSA) sequence and good organic preservation (Wadley, 2004). The cave was first excavated in 1983 by Aron Mazel of the Natal Museum. Sibudu Cave excavations have yielded an Iron Age occupation directly overlying a long sequence of final Middle Stone Age (MSA) layers dating c. 61 000–26 000 years ago. Older, undated layers contain a Howiesons Poort Industry (Wadley & Jacobs, 2004). Another MSA site from the surrounding landscape is the Umhlatuzana Rock Shelter which is located 30 km south-west of the present study area (Kaplan, 1989). Furthermore, the HIA conducted at Corobrick by Prins (2014) identified</p>

	<p>a number of out of context stone artefacts that could primarily be identified as Middle Stone Age blades and flakes. This locality is some 5 km south-west of the present study area.</p>
<p>40 000 years ago to the historic past</p>	<p>The Later Stone Age (LSA) is the third archaeological phase identified and is associated with an abundance of very small stone tools known as microliths.</p> <p>One example of a Late Iron Age (LIA) site in the general vicinity of the present study area is Umhlatuzana Rock Shelter, located roughly 17 km to the west. Rescue excavations during 1985 exposed an unexpectedly rich archaeological deposit which reached a depth of 2.5 m. Cultural assemblages from the MSA and LSA were recovered (Kaplan, 1989).</p>
<p>AD 450 – AD 750</p>	<p>The Mzonjani facies of the Kwale Branch of the Urewe Tradition represents the earliest Iron Age phase which can be associated with the study area and its surroundings. The pottery of this facies is characterised by the occurrence of punctates on rim and spaced motifs on the shoulders of the clay vessels. This facies represents the oldest known Iron Age facies from Kwazulu-Natal (Huffman, 2007). The type site was identified during the commencement of road construction some 3.5 km north-west of the study area. (Maggs, 1980).</p> <p>Mzonjani is located on a recently level hilltop that is 2.5 km inland from the coast at La Lucia and 15 km north of Durban. The site is located near Mt Edgcombe. During January 1977, a strip of land 100 m wide was bulldozed clear of sugar-cane and top soil as the first stage in the construction of the National Road 2 freeway northward up the coast from Durban. The consulting engineers, the contractors and the National Roads Department agreed to halt the earthmoving programme for several days while excavations were carried out by a team from the Natal Museum together with other volunteers. Mzonjani is the traditional name for the umndeni or 'ward' in which the site occurs. It was named after a former headman who lived there. The site itself is part of the coastal dune complex of Natal, belonging to the Berea Red Sand Member of the Bluff Formation. It is near the inland margin and consists of red sand and clay to a considerable depth. Early Iron Age (EIA) material was seen for 260 m along the freeway path. Mzonjani, dated to the third and fourth century AD represents the earliest expression of the Iron Age in</p>

	<p>Kwazulu-Natal. The excavations at Mzonjani produced large ceramic assemblage (Maggs, 1980).</p> <p>The Mzonjani assemblage is by far the largest yet available from Kwazulu-Natal for the period around AD 300, which represents the earliest expression of the EIA in this region. The distribution of EIA material reflects a village of some size. Nothing is known of the above-ground structures but the occupation must have been over a considerable period, perhaps several decades, in view of the quantity of material. The concentration of pottery around certain features could reflect relatively shallow refuse pits into which small quantities of domestic debris were tipped as they silted up with the sandy soil. Or alternatively they could reflect mobility of material, chiefly sherds and charcoal, within the soil profile due to physical, biotic or some other unknown factors. The absence of EIA sherds from exposed areas, which had not actually been bulldozed, suggests that there was some tendency for material to sink beneath the soil surface. However, since there clearly was some pit digging, this factor may also be significant in explaining the occurrence. The poor preservation of organic material means that little can be said about the economy. However, a village of several hectares suggests food production, particularly agriculture, to sustain it. Hunting, trapping and the gathering of shellfish as well as wild plant foods can be surmised on the basis of the local environment. The tuyere fragments from unit 3 and the pieces of slag excavated from 13, both contexts uncontaminated by LIA material, imply small scale iron-smelting on site (Maggs, 1980). The site is located roughly 4.1 km north-east of the present study area.</p>
<p>AD 650 – AD 750</p>	<p>The Msuluzi facies of the Happy Rest Sub-Branch of the Kalundu Tradition represents another Iron Age phase which can be associated with the study area and surrounding landscape. The pottery of this facies is characterised by broad cross-hatching, blocks of lines on rims as well as complex decoration on the neck and shoulder (Huffman, 2007).</p>
<p>AD 750 – AD 950</p>	<p>The Ndondondwane facies of the Kalundu Tradition is the next Iron Age facies to be identified within the general surroundings of the study area. The key</p>

	<p>features on the decoration of the ceramics comprise multiple bands of herringbone and cross-hatching in the neck (Huffman, 2007).</p>
AD 950 – AD 1050	<p>The Ntshekane facies of the Kalundu Tradition is the next Iron Age facies to be identified within the general surroundings of the study area. The key features on the decoration of the ceramics from this facies comprise multiple bands of herringbone on sloping necks (Huffman, 2007).</p>
AD 1050 – AD 1500	<p>The Blackburn facies of the Blackburn Branch of the Urewe Tradition represents the next Iron Age phase associated with the study area and surrounding landscape. The pottery of this facies is characterised by rim notching, spaced motifs, chevrons, punctates and appliqué (Huffman, 2007). The type site was excavated between 1968 and 1970 by Davies (1971) and is located roughly 6 km north-east of the present study area.</p> <p>The site of Blackburn (named after the former estate) lies on the crest of a red dune north of the head of the Umhlanga Lagoon, at an altitude of over 75 m. It was discovered by Drs. Beater and Maud, and was reserved from sugar cultivation by Dr. Campbell. Davies conducted a series of excavations at this site between 1968 and 1970 (Davies, 1971).</p> <p>Blackburn seems to have been a hilltop village with large patches of midden down the steep slopes. The houses were probably concentrated on the fairly level crest of the dune. Although two dwellings were identified, the researcher found that the crest of the hill had enough space for at most 19 or 20 adjacent houses of the standard size (5.5 m in diameter) and if a cattle enclosure was present the crest of the dune would have had space for another five houses. No good evidence for terracing was found, although concentrated patches of midden were observed on the slopes, which suggest that dwellings may have been built on terraces. It is therefore possible that additional houses were built on the slopes, which are too steep for building without levelling. The houses whose foundations were excavated appear to have been beehive-huts that were roughly 5.49 m across, with one or more central posts which were estimated to be more than 3.05 m high (Davies, 1971).</p>

<p>AD 1350 – AD 1750</p>	<p>Ongoing research in KwaZulu-Natal has focused on the second phase of the Blackburn sequence, known as Moor Park. During the fourteenth century, the Moor Park farmers were the first to colonize the higher altitude grasslands of South Africa's interior. In doing so they opened up possibilities for greater economic specialization and interdependence, not least because of the impossibility of smelting iron where suitable fuel was lacking. The same lack of timber also encouraged the adoption of stone as a building material (Mitchell and Whitelaw, 2005).</p> <p>The Moor Park facies of the Blackburn Branch of the Urewe Tradition is associated with pottery characterised by punctates, rim notching and appliqué (Huffman, 2007).</p>
<p>c. 1500</p>	<p>During this period, the area today known as Kwazulu-Natal became increasingly populated by black people, and documents dating to as early as 1550 indicate that these residents had generally uniform customs and language (Van Jaarsveld, 1998). While they were not known as Zulu yet, these residents were certainly Nguni. In the words of John Laband (1995:13): <i>“After about AD 1500 the evidence indicates that the Iron Age people of the Natal-Zululand region were culturally, linguistically and physically the direct ancestors of today’s black population, and that their distinctive Nguni-speaking culture had developed within their own region”</i>.</p>
<p>Early 1700s</p>	<p>Oral history relates that, approximately at the beginning of the eighteenth century, a number of other Black groups were living in the Durban area, including the Khanyawo, Nqondo, Thembu and Mpofana. While the Mpofana settled in the present-day Bluff area, the Thembu lived in most of the area where present-day Durban is located today, but south of the uMngeni River. Both these groups were fishermen. However, the Khanyawo, living on the northern side of the uMngeni River, were metal workers and used to trade spears for fish with the neighbouring Thembu (Whitelaw, 1991).</p>
<p>1770s – 1780s</p>	<p>The Thuli moved into the Natal Bay area during this time and established the Thuli Chiefdom in these areas (Whitelaw, 1991).</p>

<p>1787 - 1828</p>	<p>Shaka kaSenzangakhona, born in 1787, became leader of the small subordinate clan named Zulu, and by the time of his assassination on 24 September 1828 (Laband, 1995) King Shaka had made the Zulu the most powerful kingdom in Africa, a kingdom and people synonymous with a vast piece of South Africa still known today as Zululand and Kwazulu-Natal.</p> <p>As will be shown below, by 1824 the Zulu controlled the Durban area as well.</p>
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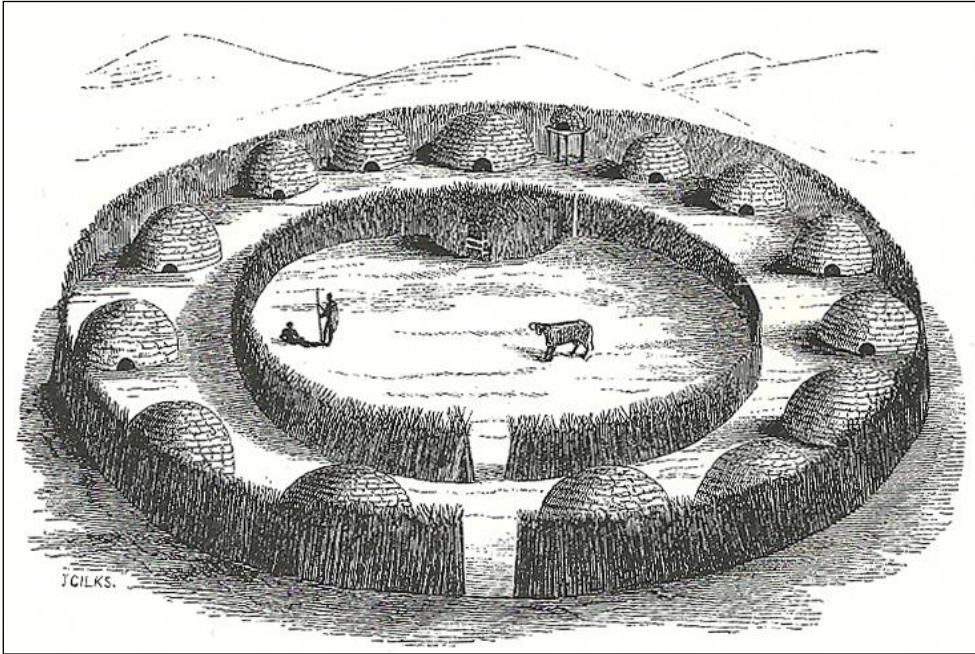


Figure 7 – A 19th century depiction of a typical Zulu umuzi (homestead) (Reader’s Digest, 1994:81).

<p>1824</p>	<p>Six Englishmen, under the leadership of Henry Francis Fynn and Francis Farewell, established a trading post named Port Natal at present-day Durban.</p> <p>By 1838 the white population of the settlement had reached thirty individuals, and a number of black refugees had settled on a permanent basis at the village as well (Van Jaarsveld, 1998).</p> <p>It is important to note that Laband (1995) indicates that Farewell had communicated with King Shaka of the Zulu for permission to establish the trading post. This indicates that the Zulu kingdom controlled the area known today as Durban at the time.</p>
<p>1828</p>	<p>In 1828, King Shaka ceded to Nathaniel Isaacs the district comprising the site of Durban (Henderson & Pay, 1939).</p>

<p>1835</p>	<p>In 1835, the settlers decided to lay out the settlement in streets and named the town D'Urban, after Sir Benjamin Durban, the Governor of the Cape Colony (Henderson & Pay, 1939).</p> <p>In the same year, the new king of the Zulu, Dingane, who succeeded after the assassination of Shaka, forbade any white person to cross over the Tugela River (Van Jaarsveld, 1998).</p>
<p>16 December 1837</p>	<p>After the arrival of Dutch speaking trek farmers (<i>Voortrekkers</i>) from British controlled Eastern Cape borderlands into the territory of the Zulu as part of the Great Trek, King Dingane attacked their laager at Blood (Ncome) River and was defeated (Laband, 1995).</p>
<p>24 April 1838</p>	<p>Fearing the increasing influence of the white traders at Port Natal, Dingane ordered his army to attack it. By chance, the vessel <i>Comet</i> was at anchor of Port Natal, and most of the white families managed to flee to the safety of the ship from where they watched the settlement destroyed (Van Jaarsveld, 1998).</p>
<p>1839 – 1843</p>	<p>With the settlement of Port Natal in ruins, and the threat of Dingane for the time being averted, the Voortrekkers established the Republic of Natalia. Two towns were established by them during this time as well, namely Pietermaritzburg (named after Piet Retief and Gert Maritz) and Congella (in the vicinity of present-day Durban) (Laband, 1995).</p> <p>Alexander Biggar was appointed the first magistrate and Port Natal was properly surveyed for the first time by George Cato. The suburbs of Cato Manor and Cato Ridge were later named in his honour (Erasmus, 2014).</p>
<p>1842</p>	<p>In 1842, after short hostilities which included the Battle of Congella and the Siege of Durban, Captain Smith with a force of 300 men occupied Port Natal (Henderson & Pay, 1939). On 31 May 1844, the territory was formally annexed to the Cape Colony (Erasmus, 2014). In 1845, the first Lieutenant-Governor, Martin West, was appointed (Erasmus, 2014) (Henderson & Pay, 1939).</p>

<p>1848</p>	<p>The first sugar cultivars were imported from Mauritius, and proved to be very successful (www.sahistory.org.za). This resulted in the rapid growth of sugar cane farming in the surroundings of present-day Durban.</p>
<p>1854</p>	<p>On 15 May 1854, the town of Durban was proclaimed a Borough and George Cato became the first mayor (Henderson & Pay, 1939) (Erasmus 2014).</p>
<p>1860</p>	<p>The system of indenture was approved by governments in India and Britain, endorsed by Natal’s colonial legislature, and financed in part by the sugar cane planters. Beginning with the 342 Indians who came on board the Truro on 16 November 1860, a total of 152,641 indentured Indian workers arrived in Natal between 1860 and 1911 (Vahed, 2012).</p>
<p>1865 possibly remove.</p>	<p>The Umgeni Sugar, Coffee and Produce Company Limited was established in 1865 “...to exploit the large sugar plantation of Sea Cow Lake, just north of Durban.” (Beinart et.al, 1986). The factory of this company was in Newlands on the northern bank of the uMngeni River and could be seen from Reservoir Hills (South African Sugar Journal, 1981).</p>
<p>11 February 1871</p>	<p>John Langalibalele Dube was born at the Inanda Mission of the American Zulu Mission (AZM). He was the president of the South African Native National Congress (which later developed into the African National Congress) between 1912 and 1917 (www.sahistory.co.za). Although Dube travelled widely, a significant portion of his life was spent at Inanda, roughly 14 km north-west of the present study area.</p>
<p>1879</p>	<p>The Anglo-Zulu War took place during this year. The Durban area would have seen a marked increase in movements of troops and supplies from the harbour to areas further north as well as the establishment of defensive works to protect the settlement from potential Zulu attacks, including ones at Verulam and New Germany (see Laband and Thompson, 1983). However, no skirmishes or battles associated with the war took place anywhere close to the present study area.</p>
<p>1880s - 1890s</p>	<p>After suffering financial bankruptcy in his early years, the early settler and sugar baron Marshall Campbell worked his way up in the Natal sugar industry during the 1880s and 1890s by consolidating central milling operations at</p>

	<p>Mount Edgecombe. He founded his company Natal Estates Ltd in London in 1895. This company eventually bought out most of the neighbouring sugar estates such as Blackburn, Saccharine Hill, Milkwood Kraal, Effingham and Umtata (Hughes, 2011).</p>
<p>1899 – 1902</p>	<p>The South African War was fought between Great Britain and the Boer republics of the Zuid-Afrikaansche Republiek and Orange Free State. Durban was not directly affected by the war, as most of the battles which took place in Kwazulu-Natal occurred at towns such as Dundee, Ladysmith and Talana. The three attempted invasions of Natal by the Boer forces (at the beginning of 1900, in September 1901 and in March 1902) were all repulsed successfully by the British forces (Brookes & Webb, 1979).</p>
<p>1904</p>	<p>In this year, Mohandas Karamchand Gandhi, who had lived in Durban since 1893, established the settlement of Phoenix (www.wikipedia.org). His reconstructed house is located roughly 8 km north-west of the study area.</p>
<p>1910</p>	<p>The Nazareth Baptist Church was established by Isaiah Shembe at Inanda. Shembe established this church on a freehold farm known as ekuPhakameni which he had purchased a short while before (www.wikipedia.org). This Shembe church is located 11 km north-west of the present study area.</p>



Figure 8 – Isaiah Mloyiswa Mdlwamafa Shembe (c. 1870 – 2 May 1935) who established the Nazareth Baptist Church in 1910 (www.ulwazi.org).

<p>1920</p>	<p>Umhlanga Rocks resort and residential village was established when local farmers began to build holiday cottages on the ocean front around the Umhlanga River and in 1920, Virginia Campbell and her husband built a hotel near the mouth of the Mhlanga River. In 1970, Umhlanga became an independent borough and two years later, incorporated La Lucia, a residential area to the south (Erasmus, 2014).</p>
<p>1921 - 1926</p>	<p>By 1921, various suburbs had sprung up around Durban and Village Management Boards were formed to provide some form of management. In 1926, the Natal Provincial Administration Board established Local Administration and Health Boards for certain areas (Henderson & Pay, 1939).</p>
<p>1931 - 1935</p>	<p>This was followed by the Durban Borough Extension and Loan Ordinance of 1931. The Municipal area was enlarged to some 67 square miles. In 1935, the status of Durban was raised to that of a city (Henderson & Pay, 1939).</p>
<p>1948-1950</p>	<p>The Ghetto Act, passed in 1948 and the Group Areas Act, passed in 1950, proclaimed certain areas for whites only. This meant that the non-White communities who found themselves in these areas would have to be moved to other areas designated as 'Indian', 'Coloured' or 'African'. The Group Areas Act displaced thousands of Indians and Africans from their homes and businesses. Indians were removed from areas such as Mayville, Cato Manor, Clairwood, Magazine Barracks and the Bluff (www.sahistory.org.za).</p>
<p>1950s</p>	<p>As a result of the Group Areas Act, which was proclaimed in 1950, a number of residential areas were established for Black, Indian and Coloured people who were removed from other areas. These newly established townships were KwaMashu, Newlands East, Newlands West and Reservoir Hills.</p> <p>KwaMashu, for example, was one of the first of Durban's dormitory townships that emerged with the implementation of the Apartheid Group Areas Act during the 1950s. KwaMashu resulted from the mass resettlement of the slum population of Cato Manor during the period of 1958 to 1965 (www.sahistory.org). Before the establishment of the township, the area was a sugar cane plantation owned by Marshall Campbell (www.ulwazi.org). The</p>

	<p>name means “the place of Mashu”, Mashu being the Zulu name for Sir Marshall Campbell (Erasmus, 2014).</p> <p>Newlands East, for example, was established as a township for Coloured people after the promulgation of the Group Areas Act (Khan, 2013). It would appear that Newlands West was also planned for Coloured people.</p> <p>Reservoir Hills is another of the areas that was zoned for Indian residence after the Group Areas Act was implemented in 1950 (Schensul, 2009). At the time, it was apparently advertised as, “an Indian area available for the more well to do Indians” (http://www.sahistory.org.za/indian-community).</p>
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4.2 Cartographic findings

Topographical maps obtained from the Directorate: Surveys and Mapping in Cape Town were used to compile a historic layering of the study area. Overlays were made on Google Earth.

4.2.1 First Edition Sheets 1:50 000 2931CA 1942 Verulam and 2930DD & 293 CC 1940 Durban

The area covered by the three route alternatives falls on the border of two sheets. This map indicates that the area proposed for the three pipeline route alternatives did not indicate any heritage features, except for a railway line located to the west of the three route alternatives.

These two map sheets were drawn in the Trigonometrical Survey Office and printed in 1940 and 1942 by the Government Printer of the Union of South Africa.

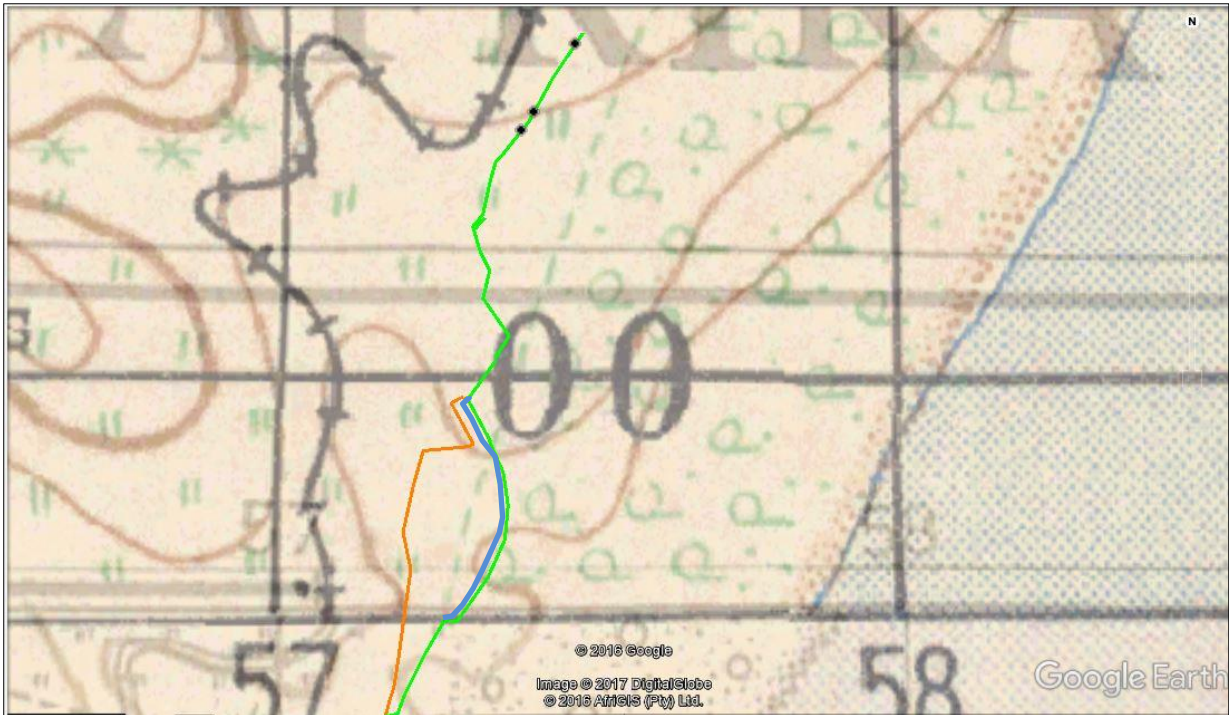


Figure 9 – View of an enlarged section of the First Edition 1:50 000 2931CA 1942 Verulam and 2930DD & 293 CC 1940 Durban Sheets overlaid on Google Earth and showing the absence of heritage features in the immediate vicinity of the three alternative routes.

4.2.2 Second Edition 1:50 000 2931CA 1969 Verulam and Fifth Edition 2930DD & 293 CC 19 Durban

The area covered by the three route alternatives falls on the border of two sheets. The 1969 Verulam map sheet was based on aerial photography carried out in 1959, was surveyed in 1969 and drawn in 1971 by the Trigonometrical Survey Office. The sheet was reprinted and published in 1979 by the Government Printer. The 1956 Durban map sheet was based on aerial photography carried out in 1953, was surveyed in 1956 and drawn in 1960 by the Trigonometrical Survey Office. The sheet was partly revised in 1972 and reprinted and published in 1975 by the Government Printer.

This map indicates that the area proposed for the three pipeline route alternatives did not depict any heritage features, except for the main road between Durban and Verulam located to the east of the three route alternatives and an intersection with two secondary roads running to the north. One possible curved recti-linear feature is indicated in the position of the alternative 1 and 3 routes, but it is not clear what that may have been.

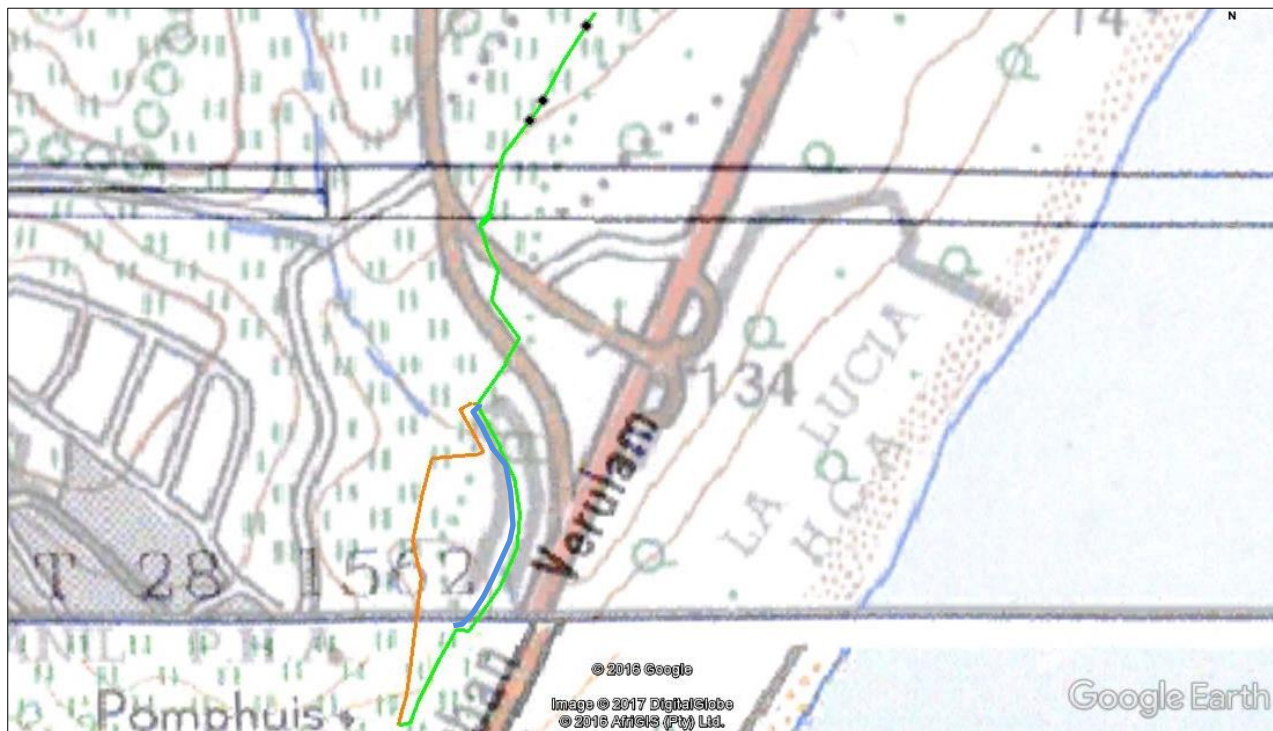


Figure 10 - View of an enlarged section of the Second Edition 1:50 000 2931CA 1969 Verulam and Fifth Edition 2930DD & 293 CC 19 Durban Sheets overlaid on Google Earth and showing the absence of heritage features in the immediate vicinity of the three alternative routes.

4.3 Previous Archaeological and Heritage Research Studies Undertaken within the Study Area

A relatively recent report by PGS for the Northern Aqueduct Water Supply Project, North-West Durban (Birkholtz, 2015) included some information for the Umhlanga area. However, this was mainly regarding known archaeological sites in the surrounding vicinity. A search of the SA Heritage Resources Information System (SAHRIS) database identified only a couple of HIA reports for the study area and general surrounding region. These reports confirm that a variety of heritage resources from different archaeological and historical periods have been identified previously within the study area and surrounding region. The details of the heritage resources identified in the different reports are provided below, in ascending order:

- **Archaeological survey along La Lucia Ridge, Umhlanga for Moreland Developments (Pty) Ltd. (Anderson, 2001)**

This study records an archaeological survey of a property located on La Lucia Ridge (however, no details of the property are provided). This property is demarcated for development. Two archaeological sites were recorded during the survey, which were assessed to be of low significance. Both sites contained Iron Age material.

- **Report on the Archaeological Survey of the Umhlanga/La Lucia Business Estate Development Site. (Whitelaw, 1992)**

During an archaeological survey of the Umhlanga/La Lucia Business Estate site, seven archaeological sites were found. Indications are that these sites date to the 11th century AD, a period about which little is known in Natal. This site lies a little inland of Umhlanga Rocks, east of the N2's Umhlanga/Mt Edgecombe interchange between the Natal Sharks Board offices and the N2.

Seven archaeological sites were found during the survey. They are all Late Iron Age (LIA) sites, dating to within the last 900 years. All were situated on the tops or upper slopes of hills. The sites, which were the remains of villages of Bantu speaking agriculturists, consisted of scatters of potsherds, grindstones and rubbish dumps or middens containing fragmentary shell.

5 FIELD WORK FINDINGS

Due to the nature of cultural remains, with the majority of artefacts occurring below the surface, a controlled-exclusive surface survey was conducted over a period of one day, on foot and by vehicle, by one archaeologist from PGS. The fieldwork was conducted on the 25th of May 2017.

The track logs (in blue) for the survey are indicated on the map below. The three alternative routes for the sewer pipeline (Alternative 1 existing - green, Alternative 2 – red and Alternative 3 - blue) have been combined in **Figure 11**.

Note: that only the new proposed alignments 1 and 3 were surveyed, as the alternative 2 (red) was totally over grown and inaccessible.



Figure 11 - Map indicating track logs (yellow) of the fieldwork undertaken along the three route alternatives

5.1 Heritage Findings

The property along the route is primarily urban in nature and is characterised by infrastructure such as roads, power lines, pipelines and railway lines. These developed areas are interspersed with small areas of veld consisting of indigenous grassland and thorn trees. Southern sections of the routes were inaccessible due to thick vegetation.

No heritage or archaeological sites were identified within the proposed pipeline route alternatives.

6 OVERALL IMPACT EVALUATION

The study has identified that the proposed project activities will not have an impact on heritage resources as no heritage or archaeological resources were identified in the project area.

6.1 Status Quo and “No Go” Areas

6.1.1 Status Quo

No heritage or archaeological sites were identified within the proposed development area for the pipeline route alternatives.

6.1.2 “No go” Areas

There are no areas considered to be “no go” areas and no further mitigation is required.

6.2 Project Impact (Unmitigated)

Since no heritage sites were identified, no impacts are expected to occur to Heritage resources as a result of the project. However, there is a possibility that construction activities, such as topsoil stripping, excavations and vegetation clearing could uncover chance finds of heritage resources previously unidentified.

The combined weighted project impact to the Heritage resources (prior to mitigation) will probably be of a low to negligible significance.

No mitigation measures are required unless chance finds of heritage resources are uncovered.

6.3 Cumulative Impact

Since no heritage resources were identified, the baseline impacts are considered to be low to insignificant and additional project impacts (if no mitigation measures are implemented) are not expected to increase the significance of the existing baseline impacts.

7 SUMMARY IMPACT ASSESSMENT TABLE

POTENTIAL IMPACTS (in order of impact as described in Impact Matrix)	ASPECT (refer to Impact Matrix)	Nature	Type	Extent	Duration	Severity	Reversibility	Irreplaceable Loss	Probability	MITIGATION POTENTIAL	IMPACT SIGNIFICANCE		MITIGATION MEASURES
											Without Mitigation	With Mitigation	
CONSTRUCTION PHASE													
Impacts on archaeological sites – chance finds	Heritage Resources	Negative	Direct	Site	Permanent	Low	Irreversible	Resource cannot be replaced	Unlikely	High	Low	Low	Refer to Section 8
Impact on burial grounds – chance finds	Heritage Resource	Negative	Direct	Site	Permanent	High negative	Irreversible	Resource cannot be replaced	Unlikely	Moderate or Partially Mitigatable	High	Low	Refer to Section 8

8 HERITAGE MANAGEMENT GUIDELINES

8.1 General Management Guidelines

1. The NHRA (Act 25 of 1999) states that, any person who intends to undertake a development categorised as-
 - (a) the construction of a road, wall, transmission line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
 - (b) the construction of a bridge or similar structure exceeding 50m in length;
 - (c) any development or other activity which will change the character of a site-
 - (i) exceeding 5 000 m² in extent; or
 - (ii) involving three or more existing erven or subdivisions thereof; or
 - (iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or
 - (iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
 - (d) the re-zoning of a site exceeding 10 000 m² in extent; or
 - (e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

In the event that an area, previously not included in an archaeological or cultural resources survey is to be disturbed, the SAHRA needs to be contacted. An enquiry must be lodged with them into the necessity for an HIA.

2. In the event that a further heritage assessment is required it is advisable to utilise a qualified heritage practitioner, preferably registered with the Cultural Resources Management Section (CRM) of the Association of Southern African Professional Archaeologists (ASAPA).

This survey and evaluation must include:

- (a) The identification and mapping of all heritage resources in the area affected;
- (b) An assessment of the significance of such resources in terms of the heritage assessment criteria set out in section 6 (2) or prescribed under section 7 of the National Heritage Resources Act;
- (c) An assessment of the impact of the development on such heritage resources;
- (d) An evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development;
- (e) The results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources;
- (f) If heritage resources will be adversely affected by the proposed development, the consideration of alternatives; and
- (g) Plans for mitigation of any adverse effects during and after the completion of the proposed development.

3. It is advisable that an information section on cultural resources be included in the SHEQ training given to contractors involved in surface earthmoving activities. These sections must include basic information on:
 - a. Heritage;
 - b. Graves;
 - c. Archaeological finds; and
 - d. Historical Structures.

This module must be tailor made to include all possible finds that could be expected in that area of construction.

Possible finds include:

 - a. Open air Stone Age scatters, disturbed during vegetation clearing. This will include stone tools.
 - b. Palaeontological deposits such as bone, and teeth in fluvial riverbank deposits.
4. In the event that a possible find is discovered during construction, all activities must be halted in the area of the discovery and a qualified archaeologist contacted.
5. The archaeologist needs to evaluate the finds on site and make recommendations towards possible mitigation measures.
6. If mitigation is necessary, an application for a rescue permit must be lodged with SAHRA.
7. After mitigation, an application must be lodged with SAHRA for a destruction permit. This application must be supported by the mitigation report generated during the rescue excavation. Only after the permit is issued may such a site be destroyed.
8. If during the initial survey sites of cultural significance are discovered, it will be necessary to develop a management plan for the preservation, documentation or destruction of such a site. Such a program must include an archaeological/palaeontological monitoring programme, timeframe and agreed upon schedule of actions between the company and the archaeologist.
9. In the event that human remains are uncovered, or previously unknown graves are discovered, a qualified archaeologist needs to be contacted and an evaluation of the finds made.
10. If the remains are to be exhumed and relocated, the relocation procedures as accepted by SAHRA need to be followed. This includes an extensive social consultation process.

Table 4: Roles and responsibilities of archaeological and heritage management when heritage resources are discovered during construction

ROLE	RESPONSIBILITY	IMPLEMENTATION
A responsible specialist needs to be allocated and should attend all relevant meetings, especially when changes in design are discussed, and liaise with SAHRA.	The client	Archaeologist and a competent archaeology support team
If chance finds and/or graves or burial grounds are identified during construction or operational phases, a specialist must be contacted in due course for evaluation.	The client	Archaeologist and a competent archaeology support team

Comply with defined national and local cultural heritage regulations on management plans for identified sites.	The client	Environmental Consultancy and the Archaeologist
Consult the managers, local communities and other key stakeholders on mitigation of archaeological sites, when discovered.	The client	Environmental Consultancy and the Archaeologist
Implement additional programs, as appropriate, to promote the safeguarding of our cultural heritage. (i.e. integrate the archaeological components into the employee induction course).	The client	Environmental Consultancy and the Archaeologist,
If required, conservation or relocation of burial grounds and/or graves according to the applicable regulations and legislation.	The client	Archaeologist, and/or competent authority for relocation services
Ensure that recommendations made in the Heritage Report are adhered to.	The client	The client
Provision of services and activities related to the management and monitoring of significant archaeological sites (when discovered). The client with the specialist needs to agree on the scope and activities to be performed	The client	Environmental Consultancy and the Archaeologist
When a specialist/archaeologist has been appointed for mitigation work on discovered heritage resources, comprehensive feedback reports should be submitted to relevant authorities during each phase of development.	Client and Archaeologist	Archaeologist

8.2 All phases of the project

8.2.1 Archaeology

The project will encompass a range of activities during the construction phase, including ground clearance, establishment of construction camps area.

It is possible that cultural material will be exposed during operations and may be recoverable, but this is the high-cost front of the operation, and so any delays should be minimised. Development surrounding infrastructure and construction of facilities results in significant disturbance, but construction trenches do offer a window into the past and it thus may be possible to rescue some of the data and materials. It is also possible that substantial alterations will be implemented during this phase of the project and these must be catered for. Temporary infrastructure is often changed or

added to during the subsequent history of the project. In general, these are low impact developments as they are superficial, resulting in little alteration of the land surface, but still need to be catered for.

During the construction phase, it is important to recognise any significant material being unearthed, and to make the correct judgment on which actions should be taken. In the event that possible heritage resources are identified a qualified archaeologist/palaeontologist must be contacted to evaluate the finds and make recommendations on the mitigation required.

In addition, feedback reports can be submitted by the archaeologist to the client and SAHRA to ensure effective monitoring. This archaeological monitoring and feedback strategy should be incorporated into the Environmental Management Plan (EMP) of the project. Should an archaeological/palaeontological site or cultural material be discovered during construction (or operation), such as graves or burial grounds, the project needs to be able to call on a qualified expert to make a decision on what is required and if it is necessary to carry out emergency recovery. SAHRA would need to be informed and may give advice on procedure. The developers therefore should have some sort of contingency plan so that operations could move elsewhere temporarily while the material and data are recovered. The project thus needs to have an archaeologist/palaeontologist available to do such work. This provision can be made in an archaeological monitoring programme.

In the case where archaeological material is identified during construction the following measures must be taken:

- Upon the accidental discovery of archaeological material, a buffer of at least 20 meters should be implemented.
- If archaeological material is accidentally discovered during construction, activities must cease in the area and a qualified archaeologist be contacted to evaluate the find. To remove the material permit must be applied for from SAHRA under Section 35 of the NHRA.

8.2.2 *Graves*

In the case where a grave is identified during construction the following measures must be taken:

- Upon the accidental discovery of graves, a buffer of at least 50 meters should be implemented.
- If graves are accidentally discovered during construction, activities must cease in the area and a qualified archaeologist be contacted to evaluate the find. To remove the remains a permit must be applied for from SAHRA (Section 36 of the NHRA) and other relevant authorities

(National Health Act and its regulations). The local South African Police Services must immediately be notified of the find.

- Where it is recommended that the graves be relocated, a full grave relocation process that includes comprehensive social consultation must be followed.

The grave relocation process must include:

- i. A detailed social consultation process, that will trace the next-of-kin and obtain their consent for the relocation of the graves, that will be at least 60 days in length;
 - ii. Site notices indicating the intent of the relocation;
 - iii. Newspaper notices indicating the intent of the relocation;
 - iv. A permit from the local authority;
 - v. A permit from the Provincial Department of Health;
 - vi. A permit from the South African Heritage Resources Agency, if the graves are older than 60 years or unidentified and thus presumed older than 60 years;
 - vii. An exhumation process that keeps the dignity of the remains intact;
 - viii. The whole process must be done by a reputable company that is well versed in relocations;
- The exhumation process must be conducted in such a manner as

9 CONCLUSIONS AND RECOMMENDATIONS

PGS was appointed by Nemaï to undertake an HIA that forms part of the BA for the proposed development of a Sewer Pipeline in Precinct 4 of the Umhlanga Ridgeside Development, Durban, Ethekewini Municipality, KwaZulu Natal.

No heritage sites were identified within the proposed development area. Therefore there is no preference of the three alternatives proposed from a heritage perspective.

No mitigation measures and permits are therefore required and there are “no go” areas identified.

However, should any chance finds of heritage sites and/or objects be located or observed, a heritage specialist must immediately be contacted and the General Management guidelines will apply (Refer to Section 8 for guidelines).

10 PREPARERS

Jennifer Kitto – Heritage Specialist

Wouter Fourie – Principal Heritage Specialist

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LEGISLATIVE REQUIREMENTS – TERMINOLOGY AND ASSESSMENT CRITERIA**1 General principles**

In areas where there has not yet been a systematic survey to identify conservation worthy places, a permit is required to alter or demolish any structure older than 60 years. This will apply until a survey has been done and identified heritage resources are formally protected.

Archaeological and paleontological sites, materials, and meteorites are the source of our understanding of the evolution of the earth, life on earth and the history of people. In the NHRA, permits are required to damage, destroy, alter, or disturb them. People who already possess material are required to register it. The management of heritage resources is integrated with environmental resources and this means that before development takes place heritage resources are assessed and, if necessary, rescued.

In addition to the formal protection of culturally significant graves, all graves, which are older than 60 years and are not in a formal burial ground (such as ancestral graves in rural areas), are protected. The legislation protects the interests of communities that have an interest in the graves - they should be consulted before any disturbance takes place. The graves of victims of conflict and those associated with the liberation struggle are to be identified, cared for, protected and memorials erected in their honour.

Anyone who intends to undertake a development must notify the heritage resource authority and if there is reason to believe that heritage resources will be affected, an impact assessment report must be compiled at the construction company's cost. Thus, the construction company will be able to proceed without uncertainty about whether work will have to be stopped if an archaeological or heritage resource is discovered.

According to the National Heritage Act (Act 25 of 1999 section 32) it is stated that -

An object or collection of objects, or a type of object or a list of objects, whether specific or generic, that is part of the national estate and the export of which SAHRA deems it necessary to control, may be declared a heritage object, including –

- objects recovered from the soil or waters of South Africa, including archaeological and paleontological objects, meteorites and rare geological specimens;

- visual art objects;
- military objects;
- numismatic objects;
- objects of cultural and historical significance;
- objects to which oral traditions are attached and which are associated with living heritage;
- objects of scientific or technological interest;
- books, records, documents, photographic positives and negatives, graphic material, film or video or sound recordings, excluding those that are public records as defined in section 1 (xiv) of the National Archives of South Africa Act, 1996 (Act No. 43 of 1996), or in a provincial law pertaining to records or archives; and
- any other prescribed category.

Under the National Heritage Resources Act (Act No. 25 of 1999), provisions are made that deal with, and offer protection to, all historic and pre-historic cultural remains, including graves and human remains.

2 Graves and burial grounds

Graves younger than 60 years fall under Section 2(1) of the Removal of Graves and Dead Bodies Ordinance (Ordinance no. 7 of 1925) as well as the Human Tissues Act (Act 65 of 1983) and are under the jurisdiction of the National Department of Health and the relevant Provincial Department of Health and must be submitted for final approval to the Office of the relevant Provincial Premier. This function is usually delegated to the Provincial MEC for Local Government and Planning, or in some cases the MEC for Housing and Welfare. Authorisation for exhumation and reinterment must also be obtained from the relevant local or regional council where the grave is situated, as well as the relevant local or regional council to where the grave is being relocated. All local and regional provisions, laws and by-laws must also be adhered to. In order to handle and transport human remains, the institution conducting the relocation should be authorised under Section 24 of Act 65 of 1983 (Human Tissues Act).

Graves older than 60 years, but younger than 100 years, fall under Section 36 of Act 25 of 1999 (National Heritage Resources Act) as well as the Human Tissues Act (Act 65 of 1983) and are under the jurisdiction of the South African Heritage Resource Agency (SAHRA). The procedure for Consultation Regarding Burial Grounds and Graves (Section 36(5) of Act 25 of 1999) is applicable to graves older than 60 years that are situated outside a formal burial ground administered by a local authority.

Graves in the category located inside a formal burial ground administered by a local authority will also require the same authorisation as set out for graves younger than 60 years, over and above SAHRA authorisation.

If the grave is not situated inside a formal burial ground but is to be relocated to one, permission from the local authority is required and all regulations, laws and by-laws set by the burial ground authority must be adhered to.

CURRICULUM VITAE OF TEAM**WOUTER FOURIE****Professional Heritage Specialist and Professional Archaeologist and Director PGS Heritage****Summary of Experience**

Specialised expertise in Archaeological Mitigation and excavations, Cultural Resource Management and Heritage Impact Assessment Management, Archaeology, Anthropology, Applicable survey methods, Fieldwork and project management, Geographic Information Systems, including *inter alia* -

Involvement in various grave relocation projects (some of which relocated up to 1000 graves) and grave “rescue” excavations in the various provinces of South Africa

Involvement with various Heritage Impact Assessments, within South Africa, including -

- Archaeological Walkdowns for various projects
- Phase 2 Heritage Impact Assessments and EMPs for various projects
- Heritage Impact Assessments for various projects
- Iron Age Mitigation Work for various projects, including archaeological excavations and monitoring
- Involvement with various Heritage Impact Assessments, outside South Africa, including -
 - Archaeological Studies in Democratic Republic of Congo
 - Heritage Impact Assessments in Mozambique, Botswana and DRC
 - Grave Relocation project in DRC

Key Qualifications

BA [Hons] (Cum laude) - Archaeology and Geography - 1997

BA - Archaeology, Geography and Anthropology – 1996

MPhil – Conservation of the Built Environment - Current

Professional Archaeologist - Association of Southern African Professional Archaeologists (ASAPA) - Professional Member

Accredited Professional Heritage Specialist – Association of Professional Heritage Practitioners (APHP)

CRM Accreditation (ASAPA) -

- Principal Investigator - Grave Relocations
- Field Director – Iron Age
- Accredited with Amafa KZN
- Field Supervisor – Colonial Period and Stone Age

Key Work Experience

2003- current - Director – PGS Heritage (Pty) Ltd

2007 – 2008 - Project Manager – Matakoma-ARM, Heritage Contracts Unit, University of the Witwatersrand

2005-2007 - Director – Matakoma Heritage Consultants (Pty) Ltd

2000-2004 – CEO – Matakoma Consultants

1998-2000 - Environmental Coordinator – Randfontein Estates Limited. Randfontein, Gauteng

1997-1998 - Environmental Officer – Department of Minerals and Energy. Johannesburg, Gauteng

Worked on various heritage projects in the SADC region including, Botswana, Mozambique and the Democratic Republic of the Congo

JENNIFER KITTO
Professional Heritage Specialist

Summary of Experience

Public participation with regards to Heritage Impact Assessments, Cultural Resource Management and Heritage Impact Assessment Management, Historical and Archival Research, Applicable survey methods, Fieldwork and Project Management; whilst working, inter alia, on the following projects:

•Heritage Assessment Projects

- HIA Report, Dolos-Giraffe Substation, Hopefield-Bultfontein,
- HIA Report, Jagtlust Mine Extension, North-West Province
- HIA Report, Kolomela, Northern Cape
- HIA Report, Decontamination of AEL Detonator Campus, Modderfontein Factory, Modderfontein, City of Johannesburg Metropolitan Municipality, Gauteng
- HIA Report, Old Rand Leases Hostel redevelopment, Fleurhof Ext 10, Roodepoort, City of Johannesburg Metropolitan Municipality, Gauteng
- HIA Report, Watershed Substation, North-West Province
- HIA Report, Solid Waste Landfill Facility, Rhodes Village, Eastern Cape
- HIA Report, Rossouw
- Phase 2 mitigation report, Cass Farmstead, Optimum Colliery, Mpumalanga
- HIA Report, Kusile Ash Disposal Facility, Witbank, Mpumalanga
- Report on Rand Steam Laundries Background History, City of Johannesburg Metropolitan Municipality, Gauteng
- New Cemetery, Barkly East, Senqu Municipality, Eastern Cape (desktop/archival research for HIA report)
- Lady Slipper Country Estates, Nelson Mandela Metro Municipality, Eastern Cape (desktop/archival research for HIA report)
- Exxaro Resources Paardeplaats Project, Belfast, Mpumalanga (field survey and archival research for HIA report)
- Copperleaf Mixed Use Development, Farm Knoppieslaagte 385/Knopjeslaagte 140, Centurion, Gauteng (field survey and archival research for HIA report)
- Isundu-Mbewu Transmission Line Project, Pietermaritzburg, Kwazulu Natal (Initial Heritage Scan (survey) for Corridor 3 Alternative 1)

Key Qualifications

BA [Hons] – Social Anthropology- 1994/1995

BA - Archaeology and Anthropology – 1993

Technical Member- Association of Southern African Professional Archaeologists (ASAPA) -

Key Work Experience

2011 -2017: PGS Heritage (Pty) Ltd

2008-2011: SAHRA Burial Grounds and Graves Unit

1998 –2007: SAHRA Provincial Office: Gauteng